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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • JULY 7, 1945

TECHNOLOGY DEPT.

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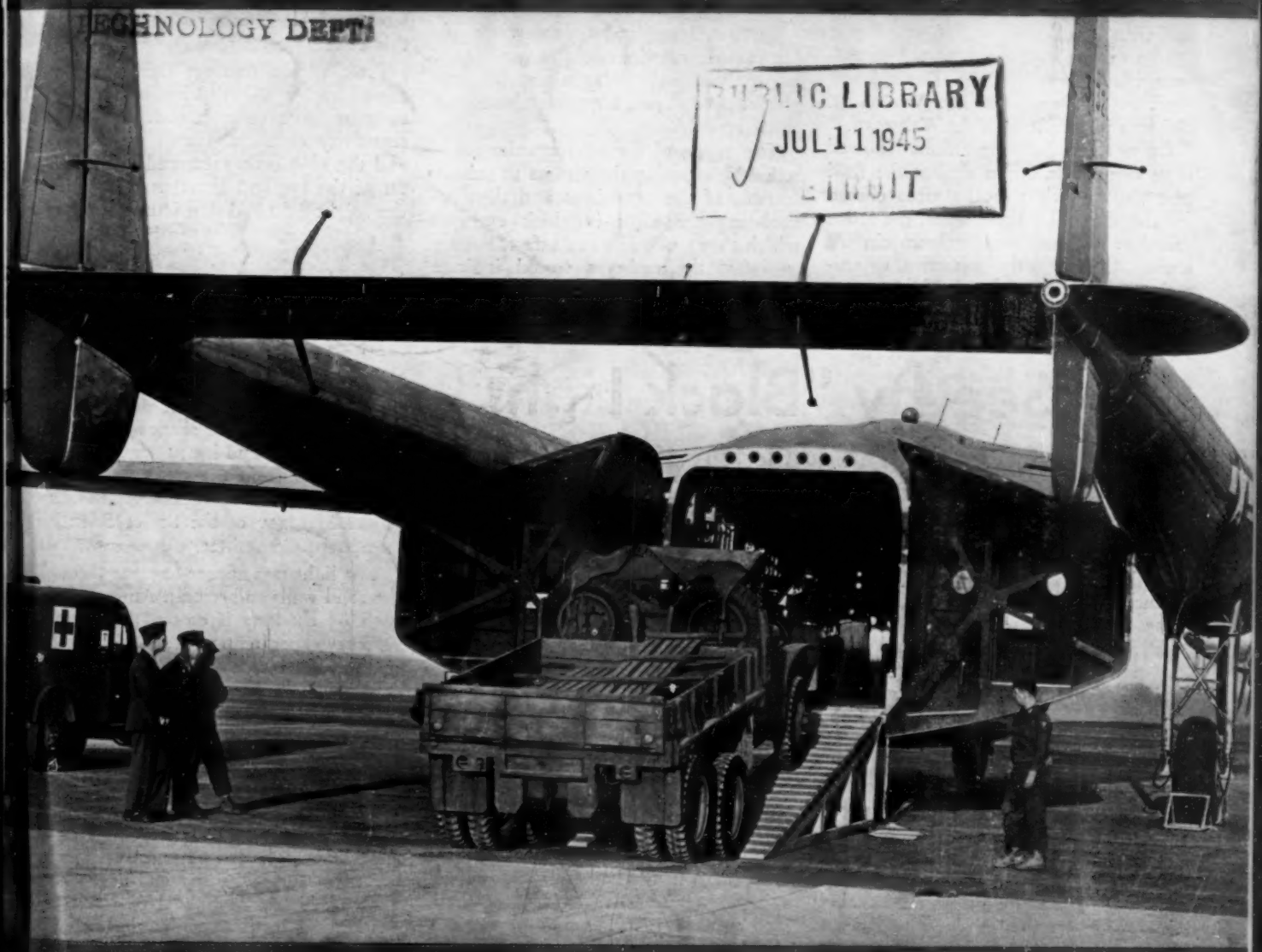

Increased Capacity

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A SCIENCE SERVICE PUBLICATION

MEDICINE

Virus Weapon Sought

150 penicillin-like substances have been investigated in the hope of discovering anti-virus chemicals to fight colds, polio and similar diseases.

➤ SEARCHING for a weapon like penicillin and the other antibiotics that will conquer virus diseases such as colds and infantile paralysis, scientists at Rutgers University and the New Jersey Agricultural Experiment Station have tested 150 microorganisms that might produce anti-virus chemicals.

The experiments are reported in *Science* (June 29), by Miss Doris Jones, Prof. F. R. Beaudette, Dr. Walton B. Geiger and Dr. Selman A. Waksman.

Only three microorganisms showed signs of possible action against the fowl pox virus which was the virus chosen for the search. Of these three, the active principle of one was actinomycin A, known to be highly poisonous to animals and therefore unsuitable for consideration as a remedy. The other two have not yet been studied enough for claims to be made about their anti-virus potentialities.

The organisms were isolated from straw-compost, manure, soil, drainage material and soil enriched with virus concentrates.

Bacteria, fungi and actinomycetes living in such material might, it was hoped, have developed antagonism for the viruses of fowl pox, laryngotracheitis and chick bronchitis.

The action of the microrganisms was tested by exposing the viruses to culture filtrates of the organisms and then inoculating the virus in chick embryos which they ordinarily can infect. Failure to infect the embryos would indicate anti-virus action of the test organisms.

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PHYSIOLOGY

Can See by "Black Light"

Patients who have had the lens of the eye removed in an operation for cataract are able to see by ultraviolet light, invisible to ordinary vision.

➤ PATIENTS who have had the lens of the eye removed in an operation for cataract are ab'e to see by ultraviolet light, invisible to ordinary human vision and popularly known as "black light." This fact was investigated in experiments conducted by Prof. George Wald of the Biological Laboratories of Harvard University.

Such patients could read the eye testing chart from top to bottom under ultraviolet lighting which made it impossible for Prof. Wald himself to see the chart.

The eye lens in man is yellow in color, Dr. Wald says in his report to *Science* (June 29). It acts like the yellow filter a photographer puts on his camera to photograph the sky. That is, it filters out light at the ultraviolet end of the spectrum, making the eye blind to it although the sense organs behind the lens, like the photographic film behind the filter, are sensitive to light of that color.

The liquid in the eye, the cornea and ocular humors, also absorb some light in the violet and ultraviolet, Prof. Wald reports.

With the yellow lens taken away, the sensitiveness of the eye to violet and ultraviolet is tremendously increased. For light of 365 milli-microns (in the upper part of the ultraviolet) the average sensitivity of the eyes with lenses removed is 1,000 times that for normal persons.

"In this radiation," Prof. Wald said, "I have frequently had 60- to 70-year-old aphakics (persons with lens removed) read a Snellen chart from top to bottom, under circumstances in which I was unable to see the chart."

"It has long been known that certain insects are highly sensitive to ultraviolet light," he pointed out, "and it has been alleged that they respond to it with a special quality of color sensation. . . . This need no longer be a matter of pure speculation."

The lens is not the only yellow filter in the human eye. In the center of the retina itself there is a yellow patch, the yellow coloring matter of which Prof. Wald found to be a chemical similar to the yellow coloring of plants. It probably is actually the same chemical, xanthophyll or $C_{40}H_{54}(OH)_2$.

The depth of the coloring in the yellow patch varies greatly, Prof. Wald found. In one person no pigmentation was perceptible; in another the pigment absorbed more than 90% of the light at 436 milli-microns. On the average, about 60% of light of wavelengths from 430 to 490 milli-microns, through the violet and blue range, is filtered out by this coloring matter.

Prof. Wald's findings were made in the course of an investigation designed to gain more exact knowledge of the sensitivity of the rod cells of the eye, and the cone cells, measured at the center of the eye and at its periphery, under bright light and dim illumination.

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CHEMISTRY

Luminous Paint Reduces Dangers in Operating Room

➤ THE USE of luminous paint on the walls, ceiling and floor of an operating room would eliminate shadows from the surgeon's hand and instruments, and reduce danger from the sudden failure of lights during an operation, reports Engineer Morozov of the Soviet Scientists Antifascist Committee.

The light rays appear to come through the solid walls and ceiling. An even light with no shadows is created by using a mercury vapor lamp with a black reflector in the room painted with the luminescent paint.

The paint is made by mixing small quantities of zinc or cadmium sulfide with ordinary paint pigments. It will give off light for about an hour and a half after the invisible ultraviolet rays have been switched off. It is also activated by natural daylight as well as artificial light.

These luminous paints have been thoroughly tested at the Union Electromechanical Institute under the direction of Prof. S. O. Maizel. Walls of a room, painted with the compound before the war, still continue to give off light despite the fact that all the windows were blown out of the building by bomb blast in January, 1941, and the paint was subjected to all kinds of weather conditions for almost three years.

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MEDICINE

Surgery in Hemophilia

Successful skin grafting operation has been performed for the first time on a hemophiliac. The bleeding was controlled by thrombin.

➤ SUCCESS in what is believed the first attempt at skin grafting on a hemophiliac, or "bleeder," is reported by Dr. Charles S. Davidson and Dr. Stanley M. Levenson, of Boston City Hospital and Harvard Medical School. (*Journal, American Medical Association,* June 30.)

An active thrombin preparation applied to the place from which the skin graft was taken apparently was responsible for saving the patient from bleeding to death from this wound.

The patient, a 26-year-old man, suffered from the hereditary bleeding disease, hemophilia. He had had to go to the hospital 13 previous times for bleeding from a cut lip, bleeding when he lost his "milk" teeth, bleeding from cuts on his knee and similar episodes.

Operations of any kind are not often undertaken on such patients because of the great danger of their bleeding to death. Excessive bleeding after such a simple operation as pulling a tooth has been a common cause of death in hemophiliacs.. Now that active thrombin preparations are available, however, hemophiliacs can have teeth pulled with relative safety.

The skin graft reported today was required because of an injury to the patient's right leg. Originally this was a bruise in which the skin was scraped off. This healed satisfactorily but after a second injury on the same place three and a half weeks later, swelling, pain and infection set in. The gangrenous skin had to be removed and later grafted with fresh skin.

The graft was taken from the patient's left thigh. Bleeding at this place was controlled instantly, the doctors report, by applying a mixture of powdered sulfanilamide and thrombin. The area healed in nine days and the graft took excellently.

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PHYSICS

Thickness Measured

Thickness of steel in walls of a boiler tank, or the level of liquid inside the tank, can now be determined accurately by using a new instrument, the Penetron.

➤ THE THICKNESS of the steel in the walls of a boiler tank, or the level of the liquid inside the tank, can now be determined accurately without drilling holes through the metal by means of a new instrument that employs radium rays from a commercially available radium salt. It can be used to measure the thickness of any type of material, and also to determine the densities of liquids.

The new instrument, called a Penetron, was demonstrated to a group of scientists in New York by the Texas Company as it is a product of a subsidiary, the Texaco Development Corporation. It will be manufactured and sold by Engineering Laboratories, Inc., Tulsa, Okla.

In use, the portable 40-pound Penetron is placed in position against the outside wall. It does not require access to the containing vessel. The apparatus has a detector head connected through a flexible rubber-coated cable to a control case. In this is electronic equipment, and on it is mounted the meter from which readings are taken.

The principle on which the instrument works is simple. Penetrating gamma rays emerge from a radioactive source. They impinge on the wall and penetrate it. Some emerge on the opposite side, and having no useful purpose, are disregarded. Another portion of the radiation is scattered in all directions by the electrons of the atoms which make up the wall. Some of these emerge on the same side of the wall from which they entered. These are the ones used to determine the wall thickness. They constitute the so-called back-scattered radiation.

By measuring the intensity of this back-scattered radiation, thickness is determinable, because, in a wall of any given composition, the intensity increases as a direct function of the wall thickness. In determining liquid level, the instrument is moved slowly down along the wall until a change in the meter reading is noted due to a variation in the intensity of the back-scattered radiation from the wall of an empty tank and the same wall when backed by a liquid.

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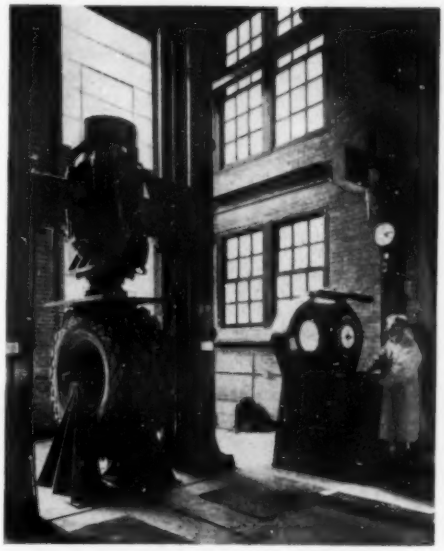

TESTS TIRES—An earthmover tire is given a deflection test under normal load by this huge tire testing machine installed at the Goodyear Tire and Rubber Company's plant. The operator is John Ward, development engineer for the company.

AERONAUTICS

Heavy-Cargo Army Plane Has Square Fuselage

See Front Cover

➤ THE PACKET (shown on the front cover of this SCIENCE NEWS LETTER), a completely new airplane for transporting heavy and bulky cargo produced for the Army, will be displayed at Hagerstown, Md., to a group of scientists and aviation writers by the maker, Fairchild Aircraft. The body of the plane is nearly square in cross-section, increasing its capacity over the ordinary fuselage which is usually rounded. It has straight sides, a flat ceiling and a level floor at truckbed height.

The fuselage is, in effect, a large flying truck or freight car with a total cargo capacity of 2,870 cubic feet. It can be loaded or unloaded through the tail doors, which when open, make an entrance eight by eight feet. When the

plane is on the ground its floor is level, permitting easy loading direct from trucks or up ramps. A small door on the left forward side permits simultaneous loading.

The wings of this new plane are high enough above the ground to let trucks pass under them with safety to both, and its horizontal stabilizer is 14 feet above the ground so the largest trucks can back up to the tail door free from obstructions.

The Packet is powered by two Pratt and Whitney Wasp engines of 2100 horsepower. It is able to lift a load of 18,000 pounds after a ground run of only 800 feet. It is constructed of aluminum alloy. Its empty weight is 28,000 pounds and its useful load 22,000 pounds. Its cruising speed is over 200 miles an hour and maximum range is 4,000 miles.

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ENTOMOLOGY

Million Crickets Killed

Crop-devouring Mormon crickets may be killed at the rate of one million per square mile by chunky-bodied wasps belonging to one species.

➤ ONE MILLION crop-devouring Mormon crickets may be killed per square mile of territory in a season, by chunky-bodied black wasps belonging to one species, Dr. Ira La Rivers of the University of Nevada estimates on the basis of careful counts made on measured sample plots in the field. He tells of his observations in the new issue of the *American Midland Naturalist* (May).

Mormon crickets are not so called because Mormons regard them with any favor. Quite the contrary, they are among the worst insect pests that beset farmers in Utah and surrounding states; their crawling, hopping hordes at times lay waste fields in the intermountain basin of the West as did the locust plague of ancient Egypt. That is why the heavy slaughter inflicted on them by the wasp is both important and welcome, not only to Latter-Day Saints but to all the inhabitants of the land.

Dr. La Rivers studied the hunting behavior of the cricket wasp long and carefully. Almost invariably, he says, she first digs the burrow in which she will later place her prey. Then she goes out to get her cricket.

She pounces on it from the air and, usually after a rough-and-tumble struggle, succeeds in stabbing the cricket one or more times on the underside of its body with her sting. This permanently paralyzes the cricket; sometimes even kills it.

Since the cricket is several times larger than the wasp, she is unable to fly off with it, but must drag it over the ground, ant-fashion. Sometimes the kill is made 20 or 30 feet from the burrow. Since the wasp apparently has no very keen sense of direction, she often has a hard time finding her way back; occasionally fails altogether.

Once arrived at the burrow, she shoves the stunned cricket in, usually head first, and deposits an egg near the base of one hind leg. Then she goes off in search of another cricket. As a rule, two paralyzed crickets, each with its wasp egg attached, are placed in each burrow before the wasp closes it up with soil and heaps a little mound of pebbles and bits of twig over the top. In this grisly catacomb the wasp's larvae hatch from the eggs, and feed on the living bodies of their helpless hosts until they are full grown and ready to undergo transformation into adult wasps and emerge into the upper world.

Two cheater insect species sometimes dog the wasp's steps as she drags her quarry home, like jackals hanging on a lion's heels. They are both members of the group known as flesh-flies. After the wasp has deposited the cricket in the burrow and attached her egg, one of these flies will slip in. Instead of laying eggs, these flies deposit tiny larvae already hatched and hungry, which immediately begin to feed on the cricket's body.

There is a third cheater, another species of wasp, that sometimes gets into the still-open burrow, crushes the cricket-wasp's egg in her jaws, deposits an egg of her own and hastily closes up the excavation. The whole business reminds one of the laying habits of the European cuckoo.

The cricket-wasp also has enemies that attack the adult insect herself. Two of them are mammals, a carnivorous field-mouse and a shrew. Three are bird species, one of them a sparrow-hawk.

Dr. La Rivers has also noticed behavior on the part of the Mormon cricket suggesting a possibility that the cricket may occasionally turn the tables on the wasp, seizing and devouring her when she is preoccupied with digging her burrow or dragging home the body of another cricket.

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Cultivated *guayule,* an American source of natural rubber, is ready to harvest in four to five years if grown on good well-watered soil; wild guayule in its arid native southwestern home requires twice this time to mature.

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AERONAUTICS

Huge Cargo Carrier

The Hermes, a gigantic airplane, is now under construction in England. It transports freight at four miles a minute with 2,000-mile range.

➤ THE HERMES Cargo Carrier, a gigantic airplane, has been announced by the Society of British Aircraft Constructors. It is under construction by the Handley Page Company, which is also building the 50-passenger Hermes transport, of which the new cargo plane is a version. Like the passenger model, the cargo plane is a low-wing, all-metal, four-engined ship. It will carry a useful load of 16,000 pounds.

The four radial air-cooled engines of this cargo carrier give a total maximum output of 6,600 horsepower. The maximum speed of the airplane is 340 miles an hour, but its economical cruising speed over long distances is 240 miles an hour, or four miles a minute. Its range is 2,000 miles.

British aircraft industry, with the European war over, is converting rapidly to the construction of civilian planes, both by remodeling war planes and by designing new planes which include improvements developed in constructing war planes. The British Minister of Civilian Aviation has announced that British airlines will use British aircraft, thus encouraging the industry.

The new Hermes is not as large as the new British flying boat, Shetland, which is a 70-passenger transoceanic airliner even larger than the Mars, the largest American-built flying boat. The Shetland is a 130,000-pound craft, while the Hermes is rated at 70,000 pounds. The Shetland has a greater wingspan than the famous American B-29 Superfortress.

Another new British plane is the Viking, an airliner with a range of 1,500 miles and constructed to carry 21 to 27 passengers. It is a single-engine plane that promises to play an important part in the development of postwar air routes to the continent of Europe. The Marathon is a new four-engined plane designed to carry 14 passengers and a half-ton of luggage and freight over a distance of 750 miles at a speed up to 200 miles an hour.

The Halifax Civil Transport is a conversion of the well-known Halifax bomber that carried much destruction to German war plants. It can accommodate 11 passengers and 8,000 pounds of freight. The equally well-known Mosquito, Lancaster and Spitfire are also under conversion for civilian uses.

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ZOOLOGY-TAXIDERMY

Miniature Animals of Plastic Look Alive

➤ THE ZEBRA guarding her young colt, American elk in mortal combat, and the rare bongo antelope of Africa, are but a few of the animals which Louis Paul Jonas, taxidermist and sculptor, has prepared for his Lilliputian Noah's Ark.

The elephant and the field mouse, the giraffe which towers above the hippopotamus—all are one-tenth the size they would be in real life. Although the number of mammals represent but a fraction of those known, the collection is the most extensive of its kind. The individual animals have been made with great accuracy and artistic skill.

Mr. Jonas, who converted an abandoned railroad station at Lake Mahopac, N. Y., into a studio, believes that models should be made so children can handle them. To make this possible he developed a plastic that is practically unbreakable—the delicate horns and long tails will last under handling. He decided to make the models one-tenth natural size, as he felt this was an easy scale for anyone to comprehend.

In making the models, first the skeleton or armature of the animal is created to exact scale. This is drawn on cardboard, cut out, and lined with wire so that the limbs can be bent into the desired position. The animal is then set upon a base and is ready to receive the clay from which the mold will be made.

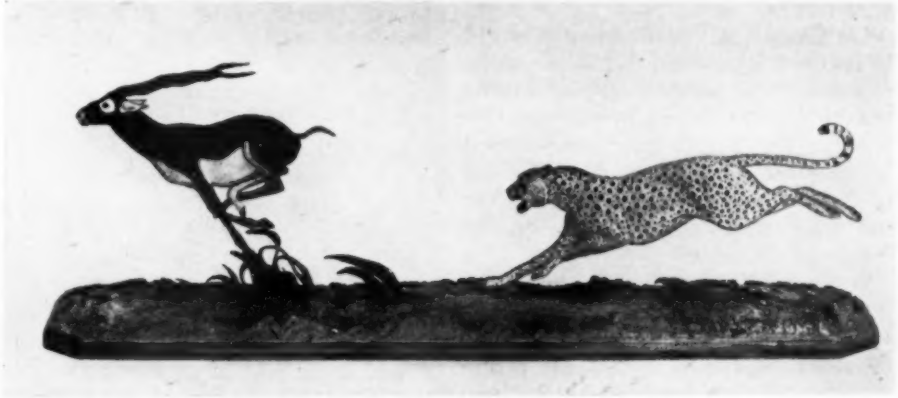
"You can well imagine how important it is to have a knowledge of the animal's anatomy when one works from the bones out," states Mr. Jonas. Throughout the process careful measurements are frequently made. About two weeks of hard work, exclusive of watching the animal at the zoo, studying pictures, and reading about it, is usually needed to make a model.

A plaster mold is cast from the clay sculpture, and self-vulcanizing rubber latex, of which the finished animal is made, is forced into the mold by compressed air.

Only a limited number of duplicate animal models are made in the finished mold since the impression eventually wears down. The original clay models, though damaged from casting, are saved and can quickly be put into shape for re-casting.

The latex plastic does not harden until it is removed from the mold and baked for 15 minutes or so. The cast shrinks slightly during baking. After the model is tooled, it is shellacked, mounted on a base and fitted with eyes. Prepared with a ground white, it is ready for the final coating of oils.

A simple animal like a bear, which only requires two or three colors, can be



ONE-TENTH NORMAL SIZE—The African black buck pursued by a cheetah is one of the most intricate animal groups in the collection recently exhibited at the Chicago Natural History Museum. Both of the miniature animals are practically in mid-air.

painted in an hour, but sometimes a day or more is needed to paint an intricate mammal like a jaguar or a giraffe. Oil paints are blended to achieve the elusive quality of an animal's coat.

The cheetah pursuing a black buck antelope was one of the most difficult animal groups to make. Both of them are practically in mid-air—the cheetah has just one paw touching the ground—yet no additional supports are necessary.

The klipspringer, a little antelope, is one of Mr. Jonas' favorites among the almost 90 animals. Capable of springing up on a 30-foot rock, in real life it is only about 22 inches high.

The elephant and the field mouse have proven most popular with children, who enjoy the contrast in size. The animals this past year have been exhibited at the American Museum of Natural History and the Chicago Natural History Museum so children and grownups alike would have an opportunity to enjoy them.

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ASTRONOMY

To Observe Eclipse

Amateur astronomers will fly to Montana to observe the event of July 9. Will take photographs from the air if the weather is bad.

➤ AMATEUR astronomers will fly from New York to Butte, Mont., to observe the sunrise eclipse on July 9. If the weather does not permit ground observations, the entire expedition will fly above the clouds to take photographs.

A Lockheed airliner, owned by Sperry Gyroscope Company of Brooklyn, N. Y., will furnish transportation both ways for members of the Amateur Astronomers Association, Inc., which has headquarters at the Hayden Planetarium in New York. R. E. Gilmor, president of Sperry Gyroscope, announced that there would be no charge to the amateur astronomers for use of the plane and its crew.

The expedition will take off from MacArthur Field, Long Island, on July 7, and land near an appropriate observing site near Butte, Mont., where the total phase of the eclipse occurs soon after sunrise.

On Sunday, July 8, the equipment will be set up. It is expected that color motion pictures of the partially eclipsed sunrise will be made, followed by the same for totality. The largest instrument carried in the plane will be a four-inch camera of 10-foot focus, giving an image of the sun itself about one and one quarter inches in diameter.

If weather does not permit ground observations, the entire expedition will take off again early Monday morning, fly above the clouds to take the photographs, and then head straight back to Long Island.

The plane will carry relatively few persons as most of its passenger space has been cleared for observing equipment. The party will include, in addition to the crew, George V. Plachy, secretary of the society; Peter A. Leavens, director of the society's camera station at Sayville, Long Island, and in charge of the expedition's photographic equipment; and a few other observers and amateur astronomers.

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Justifies Trips

➤ ALTHOUGH there is a war still being waged, the total eclipse of the sun on Monday, July 9, is a sufficiently rare and important event to justify astronomers traveling to the path of totality to observe it, Dr. John Q. Stewart, Princeton University astronomer, said.

"Before V-E Day it was announced that the Russians were sending no less than 22 expeditions of astronomers to various parts of that war-torn country," Dr. Stewart said, speaking as guest of Watson Davis, Science Service director, on the CBS program "Adventures in Science."

The eclipse will be observed also in Norway and Sweden as well as in the United States and Canada. Amateurs as well as professional astronomers are visiting the narrow band of totality that will begin at sunrise in Idaho.

Dr. Stewart explained that he has enlisted the help of some 60 foresters stationed in the path of totality in studying the advancing shadow of the moon at the time of the eclipse. Dr. Stewart himself will observe the eclipse from a point near Malta, Mont., where the sun will rise partially eclipsed.

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CHEMISTRY

Improved Methods for Extracting Actinomycin

➤ JUST as sulfanilamide, the sulfa drug, was joined by a considerable family of chemical cousins within a few years of its original discovery, so now we may expect related extracts from earth-dwelling molds to join penicillin, the first widely publicized and used germ-stopper of that origin. One such compound, known as actinomycin, together with a method for extracting it, is the subject of two new U. S. patents and assigned to Merck and Company, Inc.

The first patent, on the mold chemical itself, is No. 2,378,876, taken out by Prof. Selman A. Waksman of Rutgers University and Dr. Harold B. Woodruff, scientist in Merck's employ. Actinomycin, as they describe it, is a red substance left after a mold known as *Actinomyces antibioticus* has been subjected to ether extraction and the extract then evaporated. It can be chemically separated into two fractions, designated respectively as A and B. Actinomycin A is stated to be especially powerful in its action against certain microorganisms.

The second patent, No. 2,378,449, was granted to another Merck employee, Dr. Max Tishler, and covers an improved method for extracting Actinomycin A.

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SEISMOLOGY

Double Earthquakes Recorded in California

➤ TWO earthquakes, centered close together in the Lower California region, wrote their autographs on instruments in several American observatories on Wednesday, June 27, seismologists of the U. S. Coast and Geodetic Survey reported.

The first, which began at 9:08.3 a.m., EWT, had its epicenter near latitude 27 degrees north, longitude 111 degrees west. The second quake began at 2:08 p.m., EWT, and centered about 100 miles southwest of the first, approximately in latitude 26.5 degrees north, longitude 112.5 degrees west. Both were indicated as moderately strong shocks.

Stations reporting were those of St. Louis University, Georgetown University, and the observatories of the U. S. Coast and Geodetic Survey at Tucson, Ariz., Ukiah, Calif., Sitka and Honolulu.

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PHYSICS

New Refrigerator

May employ a high speed rotor for its sole moving part and be capable of producing temperature drops as great as 270 degrees Fahrenheit.

➤ A NEW and ingenious mechanical refrigerator employing a high speed rotor for its sole moving part and capable of producing temperature drops as great as 270 degrees Fahrenheit with high efficiency has been proposed by Prof. J. R. Roebuck of the University of Wisconsin (*Journal of Applied Physics,* May).

By combining the conventionally separate processes of compression and cooling of the refrigerant, the new refrigerator approximates for the first time in a practical fashion the thermodynamical ideal Carnot cycle with the resulting high efficiency. The principle of ideal refrigeration formulated by the early French physicist Carnot (1796-1832) states that for greatest efficiency the refrigerant must be cooled as it is compressed, thus maintaining a constant temperature while heat is being given up; and then it must expand and do work without taking on any heat to produce the greatest cooling.

The proposed device employs a strong hollow cylindrical rotor spun at a high speed through which the gaseous refrigerant passes to be cooled. The gas enters at the center of the rotor at one end. Centrifugal force which is proportional to the distance from the center causes the gas to be compressed as it moves out to the rim of the rotor.

This centrifugal compression causes the gas temperature to rise and allows the heat contained in the gas to be transferred to cooling coils placed inside and spinning with the rotor.

Thus the gas is compressed at a constant temperature, and at the rim of the rotor it is highly compressed but at essentially the same temperature as it had on entering.

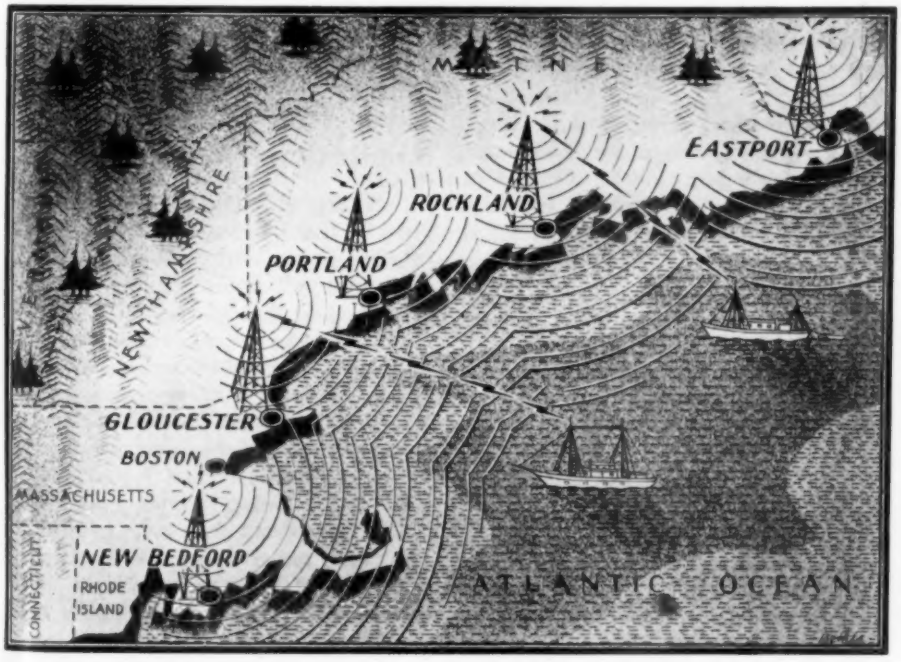
Then by allowing the gas to flow back to the center of the rotor through insulated passages, the temperature drops as the centrifugal compression is removed and as the gas does work on itself in expanding. Thus the gas is expanded while doing work with no heat transfer, and the two parts of the ideal Carnot cycle are approximated.

Because of the compression and heat transfer that takes place, the gas in the ducts going back to the center will be denser than that going outward, and therefore flow in the forward direction requires that the gas pressure be higher at the input than the output. The power required to maintain this pressure difference causes the refrigeration. Practically no rotational energy is extracted from the rotor because all the rotational energy taken from the rotor by the gas when moving outward is given up again when it moves back into the center.

The temperature drops produced are dependent upon the rotational speed of the rotor and therefore the structure must be made very strong to support the enormous centrifugal stresses.

Typical uses proposed for this refrigerator are commercial refrigeration by cooling air as the refrigerant from room temperature to about 70 degrees below zero Fahrenheit in one stage; the liquefaction of gases by using several stages in succession; and winter heating of homes by using a modification of the device as a Kelvin heat pump.

Science News Letter, July 7, 1945



AID SHIPPING—Five new coastal harbor radiotelephone stations will soon be in operation on the New England coast. The stations will be particularly valuable to the great fishing fleets from New England ports operating in the north Atlantic.

COMMUNICATIONS

Five New Radiotelephone Stations Are Planned

➤ SIX instead of one coastal harbor radiotelephone stations will soon be in operation on the New England coast for the benefit of shipping on the Atlantic if applications now filed with the Federal Communications Commission are approved. They will be installed by the Raytheon Manufacturing Company of this city at Eastport, Rockland and Portland, Maine, and at Gloucester and New Bedford, Mass. The one existing station is at Boston, operated by the New England Telephone and Telegraph Co.

While the service will be of benefit to all shipping in the general area, it will be particularly valuable to the great fishing fleets from New England ports operating in the north Atlantic. The new stations will also provide service to properly equipped trucks and buses within their ranges.

Science News Letter, July 7, 1945

Bamboo, treated with plastics to make it water- and insect-proof, is being used in Latin America to crate foods for ocean shipment.

PSYCHIATRY

Facilities Are Meager For Discharged NPs

➤ THE DISCHARGED soldier who needs treatment for shattered nerves or mental illness may not be able to find it, a survey made by the National Committee for Mental Hygiene rveals.

There are 25 states without a single community clinic and " vast areas" in other states where no psychiatric help is available, it was found. Of all the established hospitals and clinics in the entire country, only 139 certified their preparedness to treat mental casualties.

Although the veteran is entitled to treatment, the Veterans Administration can't provide it when neither clinics nor psychiatrists are available, the Committee reports.

"The number of Veterans Administration neuropsychiatric hospitals is at present limited to 30," the Committee states. "They offer hospitalization to all who need it but there is overcrowding. The most serious deficiency, however, occurs in connection with outpatient treatment. Because many of these hospitals are located near large cities the outpatient treatment which they have to offer is impossible for men who live in the country.

"Besides, the Veterans Administration cannot furnish or find anything like adequate outpatient clinic facilities for all those dischargees who do not need to be hospitalized but do require psychiatric treatment.

"This lack of outpatient care is very serious. Both in the interest of the veteran and in the interest of the citizenry at large, psychiatric care should be available throughout the country; this would necessitate increasing the present number of psychiatrists by at least 10,000 together with the necessary auxiliary staffs."

Science News Letter, July 7, 1945

PLANT PHYSIOLOGY

Colchicine in Small Doses Speeds Plant Growth

➤ COLCHICINE, the "evolution chemical" that has been used to originate new species of plants by multiplying the heredity-bearing chromosomes of old ones, also has the power of greatly speeding up plant growth when used in weaker concentration, Prof. Earl E. Newcomer of the University of North Carolina states. (*Science,* June 29).

Prof. Newcomer used colchicine in a four-tenths of one per cent solution. He placed one drop of this per day on the growing points of young oak and chestnut trees, hazel bushes and other plants. In some cases the treatment produced unfavorable results, even death, but in 16 seedlings of the species named he found that growth went on at double the usual rate.

In previous researches by two Chinese researchers, T. Loo and Y. Tang, a speeding-up of seed germination in corn, rice, wheat, cabbage and mungo bean had been reported.

Science News Letter, July 7, 1945

PALEONTOLOGY

Fossil Mites Found in Marble Desk Pen Base

➤ TWO FOSSIL mites, eight-legged creatures related to spiders, have been found embedded in the polished stone of desk pen bases made of onyx-marble from a quarry in Arizona. They represent an entirely new group of arachnids, states Prof. Alexander Petrunkevitch, Yale University paleontologist, who has made a close study of them.

The two specimens are quite small: over-all body length is approximately one-eighth of an inch, which is also the length of the longest leg. They are remarkably well preserved; the bristles with which they were covered and the tiny claws at the ends of the legs are clearly visible under low powers of the microscope.

The onyx in which the specimens are embedded was formed out of lime-charged water in a cave of relatively recent geologic date, classified as Cenozoic by geologists. The dead mites were apparently washed in and left behind in the thickening calcite slush as the water slowly evaporated. Finally it hardened to solid, dark-brown stone, holding them fast.

The two pen-bases were sent to Prof. Petrunkevitch by J. W. Fisher, president of the company that owns the quarry. One of them has been returned to him; the other, which holds the type specimen, is retained in the Peabody Museum.

Because certain details of the leg formation suggest that the mites may in life have progressed with a kicking movement, the new genus has been given the generic name *Calcitro,* which is a Latin word meaning "kicker". The second or specific name is *fisheri,* in honor of Mr. Fisher, the original finder of the specimens.

Detailed description of the new fossil species is published in *American Journal of Science* (June).

Science News Letter, July 7, 1945

IN SCIEN

ASTRONOMY

Venus Mistaken for Jap Balloon by Observers

➤ THE PLANET Venus, which is bright enough to be seen in daylight, was mistaken by lookouts for Jap balloons, a number of which have been reaching the Pacific Coast.

Inmates at San Quentin Prison, where regular watches are kept for the enemy balloons, reported recently that a Jap balloon could be seen very high and nearly overhead, though slightly south of the prison, states Leavitt Baker, Jr., deputy in charge of identification, communication and records. Several days later at about the same time a balloon was again reported in approximately the same position.

Upon contacting the Lick Observatory, Mr. Baker learned that the planet Venus was in the exact position indicated, and, though it had reached its maximum brightness late in May, was still visible to the naked eye in full daylight. Checking with the Interceptor Command, he learned that hundreds of reports had been received throughout the area for balloons in this position.

Science News Letter, July 7, 1945

ELECTRONICS

Super-Tool Measures Infinitesimal Movements

➤ AN ELECTRICAL instrument, so sensitive that it can measure movements, or changes in position, as small as one-tenth of a millionth of an inch, has been developed at the Battelle Memorial Institute. It is a new super-tool for scientists to measure the position of either slowly or rapidly moving objects without touching the object itself. Its first practical application was in measuring the errors in high-precision lathe spindles used in machining aircraft motor parts.

The instrument is also the heart of an apparatus for measuring and recording the changes in crystal structure when steel is heated rapidly, as in electric welding. Other possible, but as yet undeveloped, uses of this electrical micrometer are as a meter to indicate the power output of airplane engines in flight, and as a means of measuring roughness and hardness of metallic surfaces.

Science News Letter, July 7, 1945

NCE FIELDS

CERAMICS

Plants in Glass Pot Feed on the Glass Itself

➤ GROWING plants in glass flower pots will feed on the walls of the pots themselves if they are made of a new nutrient glass fertilizer. The glass will supply all the necessary food elements except nitrogen, organic matter and water.

This use is suggested by A. E. Badger and R. H. Bray of the department of ceramics engineering of the University of Illinois as one of the results of work carried out on the solubility of fused mixtures of rock phosphate, potassium carbonate, and silica.

Should proper solubilities be obtainable with the more complex mixtures, these scientists state, and costs be competitive with present fertilizers, glass fertilizers may offer interesting advantages. The ease with which glass can be manipulated, the scientists say, suggests many commercial adaptations for soilless growth experiments as well as ordinary applications for soil enrichment.

Science News Letter, July 7, 1945

NAVIGATION

Location of Submerged Sub Found by Observing Sun

➤ THE GEOGRAPHIC position of a submarine can be determined when it is 60 feet under water by observing the sun through the periscope.

In a submarine submerged off the Yucatan peninsula, Paul R. Frank took measurements of the sun as it crossed the meridian and found his position exactly. This is one of the first times a "fix" has ever been obtained from a submarine while submerged, he states in the United States Naval Institute Proceedings.

Navigators on submarines conducting submerged patrol near the equator might find useful the ability to obtain the position of the ship without surfacing, believes Mr. Frank, biographical information on whom must be kept secret for security reasons.

It would even be possible for the position of a submerged submarine to be secured not only near the ecliptic, but for all the Pacific submarine patrol areas, with an error of only about two miles, he states.

The sun was almost directly overhead at the time Mr. Frank determined his submerged position. Azimuth readings were taken at half-minute intervals from 10 minutes before until 10 minutes after local noon. From these data were found points on the earth's surface directly beneath the sun and only 150 miles away. The point of intersection of these lines accurately indicated the position of the ship, Mr. Frank reported.

Since the submarine was proceeding at slowest submerged speed, the movement of the ship was disregarded. The only difficulty encountered occurred when the ship slightly changed its position in relation to the horizon during one stage of the observations. But since the sun was so nearly overhead, a slight change in the angle of the ship caused a considerable and immediately apparent error in the bearings.

Science News Letter, July 7, 1945

AERONAUTICS

First Jet-Propelled Plane Is Now a Museum Piece

➤ AMERICA'S first jet-propelled airplane is now a museum piece, on display to the public at the Smithsonian Institution in Washington, D. C. It is the experimental plane built by Bell Aircraft Corporation for the Army Air Forces, and is the first jet-propelled plane constructed and flown in the United States.

No longer needed in the military service, because many additional jet-propelled planes have been built, it was transferred to the Smithsonian by the War Department to take its place in the Institution's historical collection of famous aircraft.

Science News Letter, July 7, 1945

HERPETOLOGY

Six Grass Snakes Arrive In U. S. from England

➤ SIX GRASS snakes have arrived at the Philadelphia Zoo from England. Although the grass snake resembles our own garter snakes, it is actually a water snake which differs from its American relatives by laying eggs instead of producing its young alive.

The coming of these snakes, shipped from the Regent's Park Zoo in London, marks the resumption of trading between the two institutions. A shipment of birds and mammals, now being readied at the zoo, will soon be sent to the London institution.

Science News Letter, July 7, 1945

CHEMISTRY

Eggs Kept in Water Glass Should Also Be Cool

➤ EGGS ARE scarce, and are expected to become scarcer. Persons who own chickens, or have any other means of acquiring surplus eggs, and who intend putting them up in water-glass, a time-honored method of preserving eggs, are advised not to depend on this method alone, but to keep them well refrigerated also, by Prof. G. O. Hall of Cornell University, who has just concluded a series of experiments in this field.

Eggs of uniform quality were placed in water glass and held for six months. One lot was kept at temperatures of 34 to 36 degrees Fahrenheit, another at 55 to 58 degrees, and a third at ordinary room temperature.

The eggs held at 34 to 36 degrees rivaled fresh eggs in all respects except flavor and odor. Of 189 eggs candled, 178 were of A grade quality or better. Appearance of these eggs on breaking the shells was satisfactory.

Of 239 eggs held from 55 to 58 degrees, 173 had to be classed inedible, according to recognized market classifications, because of stuck yolks.

In eggs held at room temperature (40 to 90 degrees, F.) none graded higher than B, and 142 of 187 were graded inedible because of stuck yolks. When broken, these eggs had little or no thick white and the yolks were very flat. It was difficult to break the eggs without mixing yolk and white, Prof. Hall reports.

Science News Letter, July 7, 1945

CHEMISTRY

Dinitrates Improve Diesel Fuel Ignition

➤ IMPROVING the ignition qualities of Diesel fuels by the addition of what might be called mild-mannered cousins of TNT is the at first slightly startling proposal that won patent 2,378,466 for Dr. George O. Curme, Jr., chemist in the laboratories of the Carbide and Carbon Chemicals Corporation.

TNT, nitroglycerin and other high explosives are trinitrates of carbon-containing compounds. To pep up the often sluggish ignition of diesel oils, Dr. Curme adds small percentages of the dinitrates of either polyethylene glycol or polypropylene glycol. These dinitrates are chemically somewhat similar to trinitrates, but are less temperamental in their behavior.

Science News Letter, July 7, 1945

POPULATION

Grandchildren of the War

The echo of the present war boom in babies is expected in 1965. These children will stand an exceedingly good chance of growing to maturity.

By MARTHA G. MORROW

➤ ANOTHER boom in babies is expected in the United States about 20 years from now when the stork brings large numbers of grandchildren of the great war. Babies born around 1965, a large number of them children of our war-boom babies, will stand an exceedingly good chance of growing to maturity—far better than did their grandparents or even their parents—thanks to the great advances being made in keeping infant and childhood diseases in check.

These grandchildren of the great war, much more than their parents, may enjoy quiet streets where they can ride tricycles and trees which they can climb, since an increasing proportion of the population probably will live in smaller cities and suburban areas.

The chance of their having at least four or five brothers and sisters will be less than for their own parents, for families are becoming smaller. They will also probably grow up in smaller houses than did their parents, due largely to the decreasing size of families, lack of servants and higher cost of building. There is likewise an excellent chance that they and nearly all of their playmates will have native-born parents. Today 13 out of 14 American babies are born to native parents, and unless there is a change in our immigration laws, few parents in 1965 will be foreign-born.

More Conservative U. S.

These babies, however, may grow up in a much more conservative and less exciting United States. Twenty years from now an increasing number of the voters will be older people, so the political parties will be more under their control, probably leading to an increasing tendency to keep affairs just as they are. The average age of stockholders in corporations will also increase, probably resulting in older men on the boards of directors and a less pioneering manner of conducting business.

People will probably be more interested in culture and the arts when they become of age than the average American is today. Youth is more concerned with forging ahead and making a place in the world; later in life there is apt to be more reflection and less action.

The average age of people in the United States has been steadily increasing. Half of the people in America in 1800 were 16 years of age or under. By 1900, the average population had increased in age and half of the people were around 23 years or under, the other half being over that age. Half of the people in 1940 were 29 years or under, and by 1965 there is a pretty good chance that the dividing line will come around 33 years of age.

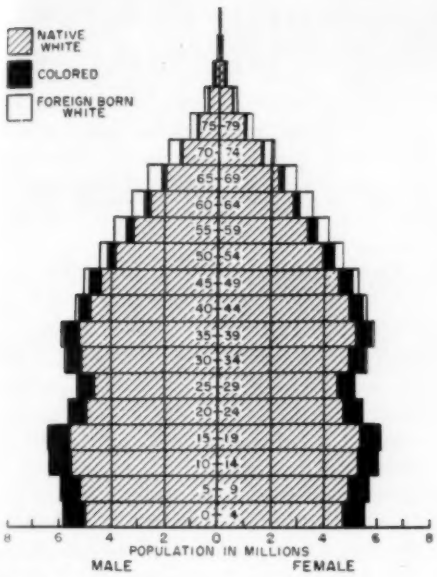
Between 11 and 12 million children in the United States in 1965 will be learning to walk and talk, going to play or nursery school, being under five years of age. Those between five and 19 will number over 35,000,000. This is the estimate of two population experts, Dr. Warren S. Thompson and Dr. P. K. Whelpton of the Scripps Foundation for Research in Population Problems at Miami University, Oxford, Ohio.

The largest proportion of the population will be between the ages of 20 and 44—there will be nearly 58,000,000 of these, a majority of them married and starting families of their own. People between the ages of 45 and 65 will number about 36,500,000, Dr. Thompson and Dr. Whelpton believe, while nearly 15,000,000 men and women will be 65 or over.

This means that about 156,000,000 people will probably be living in the United States in 1965, as contrasted with the 138,000,000 here today. But these population experts do not believe that the number of people in the United States will increase indefinitely. Their calculations show that the population is likely to reach a peak of 160,000,000 to 165,000,000 a few years before the end of this century, and then decrease slowly.

There will be a larger proportion of colored people in the United States 20 years from now than at present, about 17,500,000 being colored. There were 14,300,000 colored people in the United States at the beginning of this year and

CHILDREN OF 1965—Children of the war-boom babies of the United States, much more than their parents, will live on quiet streets. A greater proportion of the population will live in smaller cities and suburban areas 20 years from now. Photograph by Fremont Davis, Science Service staff photographer.



POPULATION CHART—An estimate of the number of males and females in the United States in 1965, their ages and whether they will be native white, colored or foreign-born white is given by Dr. Warren S. Thompson and Dr. P. K. Whelpton of the Scripps Foundation for Research in Population Problems.

unless we have immigration, the population of the United States within the next two decades will become increasingly colored, due primarily to a higher birth rate among Negroes than among white persons.

Most of the population increase is likely to go to smaller cities and suburban areas. Many of the additional men may work in big cities, but as a rule they will not live in them. The number of farmers and persons in farm families will probably decrease as more labor-saving machinery is used on farms. But farmers now work longer hours than city people. So, if working hours on the farm are cut, the farm population may increase.

The proportion of the population in manufacturing and mining has been going down and probably will continue to do so. The proportion of doctors, lawyers and white-collar workers, on the other hand, will continue to increase.

Romances will lead to marriage at a younger age in 1965. During the last half century white girls have been marrying younger and will probably continue to do so. The majority of the boys who marry will do so between the ages of 20 and 27, while the girls will be 18 to 25. Many of the girls may continue to work until the husband is in a position to support them, but contraceptive information makes it possible to marry earlier without running as great a chance as in the past of starting the family before they are financially prepared to do so.

There will be fewer bachelors 20 years from now than there were before the war, for instance, as men will have a better selection. In the past males outnumbered females in the United States, chiefly because there were so many men among those immigrating to America. In the future there will be an excess of females here. But only about eight or ten percent of the women will remain single, about nine out of every ten having been married by the time they are 50.

There will be a decline in the number of children born in the future, as the

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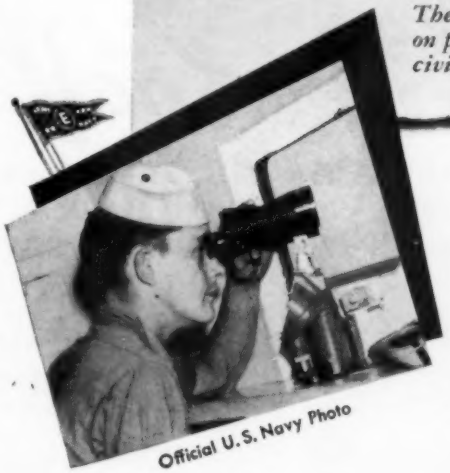

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Do You Know?

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Invisible *electrons* move through the tubes of a television set at a rate of 28,000 miles per second.

A *honeybee* visits some 200 flowers to gather a load of pollen on a single trip before returning to the hive.

Lime and commercial *fertilizers,* in spite of advice to the contrary, may be applied to the land at the same time and covered into the soil in one operation.

Lack of *vitamin C* causes bones to become brittle and break easily, and also prevents them from healing when broken.

A spiny species of *cactus* grows in Colorado at 7,000 feet above sea level; it is one of the few cacti that will stand cold winters.

Cobalt seems to be as essential in animal nutrition as it is in human nutrition; a cattle disease, that occurs in various sections of America, is thought to be due to cobalt deficiency.

Industrially important Engelmann *spruce trees* in four national forests in Colorado are facing destruction with an unprecedented increase in the hosts of a native, rice-sized beetle, *Dendroctonus engelmanni.*

decline in birth rate continues. It will be due more, however, to fewer children per family than any great decrease in the number of women having children.

The number of children who die will be quite low. In 1915, of every 1,000 white babies born alive, in the birth registration states, 99 died before they were one year old, and of every 1,000 colored babies, 181 died.

In 1943, 37 white babies per 1,000 died; 62 colored babies per 1,000 died. Colored people will continue to die younger, Dr. Whelpton stated, but because of poorer housing and a lack of money for medical care rather than for biological differences.

The life expectation of white males in 1965 will be about 67 years, whereas white females will have a life expectation of about 70½ years. This is because women are tougher biologically than men from the time they are conceived, and infant mortality is higher among men. The risks of childbearing are less than the occupational risks of men.

The average number of years lived by colored men two decades from now, if conditions continue as we think they will until 1965, will be about 60.3 years. The life expectancy of colored women will be about 62.5 years.

The average length of life of the American people in 1942, the highest to date, was 64.8 years. This does not mean that people are setting new records for longevity, for few live to be over 100. The expectation of life has gone up and will continue to go up after the war primarily because we succeed in getting a large number of babies to live to 60 or 70 years of age.

People in the future will die largely of old age. Heart failure, softening of the brain and hardening of the arteries will take large numbers of people. Research in many lines is making progress in catching diseases in time and prolonging life.

Population experts base their estimates for 1965 or any other future year by studying past trends. Excellent data are available at the U. S. Bureau of the Census, division of vital statistics, since 1933 as births and deaths throughout the whole United States have been reported since that time. Some idea of what happened between 1900 and 1933 can be secured by knowing what happened in the birth and death registration areas, but before 1900 there was no Federal reporting, and only a few states and cities kept their own records.

At different times in the past, compilations have been made on births and deaths which help in working out trends. In an early census, for instance, people were asked about those who died in the preceding year. Census information secured throughout the nineteenth century dealt with children under five, so that by allowing for those who died or were not reported, some idea of the number of children born during the preceding five years could be secured.

When a trend has been found, then the population expert must begin thinking about what caused the trend and where it is likely to lead—and hope his conclusions are correct.

Science News Letter, July 7, 1945

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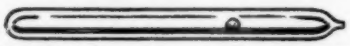

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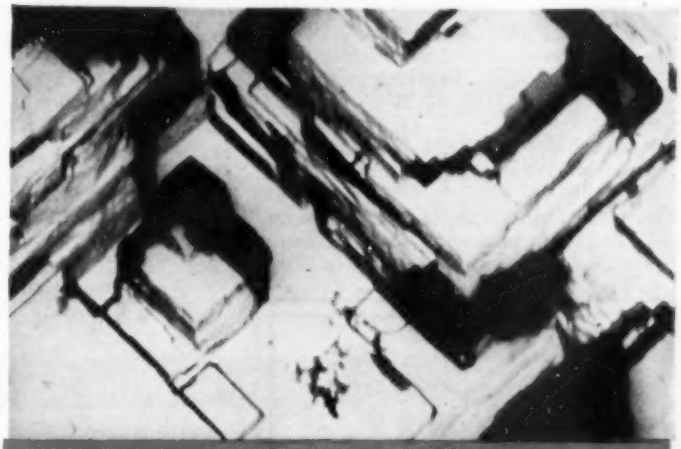
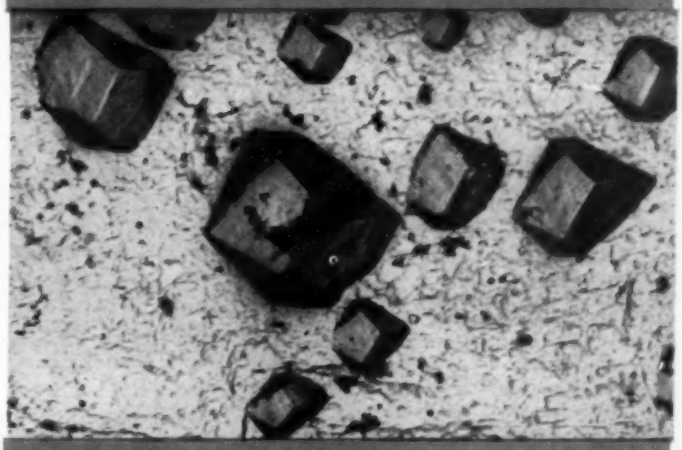
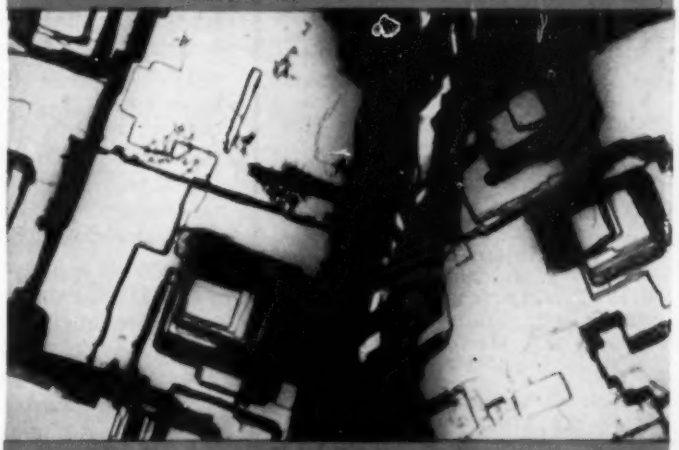


OXIDE FILM X 11,500
Cubic block structure within a single grain, in a deep-etched sample of an annealed aluminum alloy sheet.



OXIDE FILM X 5,000
Cubic etch pits, in a deep-etched sample of an annealed aluminum alloy sheet.



OXIDE FILM X 11,500
Cubic block structure adjacent to a grain boundary, in a deep-etched sample of an annealed aluminum alloy sheet.

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COMMON AILMENTS OF MAN—Morris Fishbein, ed.—*Garden City Pub. Co.*, 177 p., $1.

THE FLORA OF OAKLAND COUNTY, MICHIGAN: A Study in Physiographic Plant Ecology—Marjorie T. Bingham—*Cranbrook Inst. of Science*, 155 p., paper, illus., $1. Bulletin No. 22.

GENERAL BIOLOGY—Leslie A. Kenoyer and Henry N. Goddard—*Harper*, 653 p., illus., $4.50. Revised ed.

HANDBOOK OF PRACTICAL BACTERIOLOGY: A Guide to Bacteriological Laboratory Work—T. J. Mackie and J. E. McCartney—*Williams & Wilkins*, 720 p., $5. A William Wood book.

PRINCIPLES OF RADIO—Keith Henney—*Wiley*, 534 p., illus., $3.50. Fifth ed., revised and enlarged.

THE STORY OF A COUNTRY MEDICAL COLLEGE: A History of the Clinical School of Medicine and the Vermont Medical College—Frederick Clayton Waite—*Vermont Historical Soc.*, 213 p., $4.50, illus.

TECHNICAL DATA ON PLASTICS—*Plastics Materials Manufacturers' Assoc.*, 163 p., paper, $1.50. Spiral binding.

THE WAY OF AN INVESTIGATOR, A Scientist's Experiences in Medical Research—Walter Bradford Cannon—*Norton*, 229 p., $3.

YOUR NERVES, How to Release Emotional Tensions—Louis E. Bisch—*Funk*, 310 p., $2.50.

Science News Letter, July 7, 1945

A Scientist's Experiences in Medical Research

THE WAY OF AN INVESTIGATOR

By Walter B. Cannon, M. D.

George Higginson Professor of Physiology, Emeritus
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Based on the varied experiences of a distinguished career, and written with the modesty of a man devoted to the ideals of his profession, *The Way of an Investigator* is both an autobiography and a vivid picture of the laboratory in which today's scientist carries on his researches.

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RADIO

Two Radio Stations Beamed On Japan from California

➤ TWO powerful radio stations on the coast of California, each housing three high-frequency transmitters, soon will be in complete operation, each with a new 200-kilowatt transmitter added to the two 50-kilowatt transmitters already in use. All six transmitters are beamed on Japan to carry to the people of the Nipponese empire the war information that they should have and can not get otherwise.

Only one other radio station in the world has such a powerful unit. These two California stations are operated for the Office of War Information, one by the Columbia, and the other by the National Broadcasting Company. Their programs will reach all parts of the world occupied by the Japanese, including the homeland, Manchuria, Korea, China and distant islands in the South Pacific. Six radio voices may be on the air at one time, or the three transmitters in either station may carry the same program at the same time to forestall jamming by the enemy.

These new high-frequency stations are the results of cooperation of engineers of the OWI, two major broadcasting systems, the International Telephone and Telegraph Co., and the Federal Telephone and Radio Corporation. This latter company constructed the main units for a 200 kw high-frequency broadcast transmitter, two rectifier power supplies, modulators, cooling systems and the radio control panels.

Science News Letter, July 7, 1945

ZOOLOGY

NATURE RAMBLINGS by Frank Thone

Untamable Animals

➤ INDIANS in several parts of the Americas—Mexico, Yucatan and Guatemala, Colombia, the Andean plateau—built up civilizations that in their material monuments at least were equal to those of ancient Egypt, Mesopotamia and India. But whereas the Old World peoples had plenty of beasts of burden, our Indians had to depend almost altogether

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on their own muscle power for transportation. The Old World peoples, even in prehistoric times, caught and tamed donkeys, horses, oxen, camels, elephants, water buffalo and—in the Far North—reindeer.

The only wild animal that was tamed and made a burden-bearer in any part of the Americas was the llama of the Andes. And even at best, the llama is a very poor kind of a work-animal. If you load more than about a hundred pounds on its back, it just lies down and will not budge until you take some of it off.

The Indians north of the Incas' realm didn't even have llamas. Some of the Plains tribes fashioned travoises for their dogs to drag during their migrations; but the burden a dog is capable of hauling by such primitive means would not be even as much as an elderly squaw could carry.

It has been a subject of speculation, sometimes, what might have happened had it ever occurred to the Sioux, or the Pawnees, or some of the other Plains tribes, to tame the bison or American buffalo. The most probable answer is, that it simply wouldn't have worked out. Although a fairly close cousin to our domestic cattle—so close, indeed, that the two can and frequently have been hybridized—the bison is less intelligent than the proverbially stupid ox, and a great deal more obstreperous. On the basis of what we know about its general nature, the bison would probably have to be considered untamable.

There is one good bit of collateral evidence in support of this opinion, in the fate of the European bison, or wisent. This animal, originally widely distributed over all of Europe and much of Asia, is zoologically very closely related to the American bison, and is very much like our bison in appearance and general character.

It was known to Old World peoples of great antiquity: its image appears on some of the earliest cylinder seals of Sumeria; and it was probably the original model of the great winged bulls, that guarded the entrances to Babylonian and Assyrian palaces, long after the peoples of Mesopotamia had exterminated it from that part of the world.

Now with the readiness that man has always shown everywhere to shift his burden from his own shoulders to those of an animal, if he can find a beast sufficiently docile to accept the load, it is unlikely that the wisent would have escaped captivity and domestication if it had been in the least amenable to such treatment. But it wasn't. To the very end (which probably came during the present war) the wisent continued to be a beast of the chase only. It could be hunted and killed, but not tamed. And so it was with our own American bison.

Science News Letter, July 7, 1945

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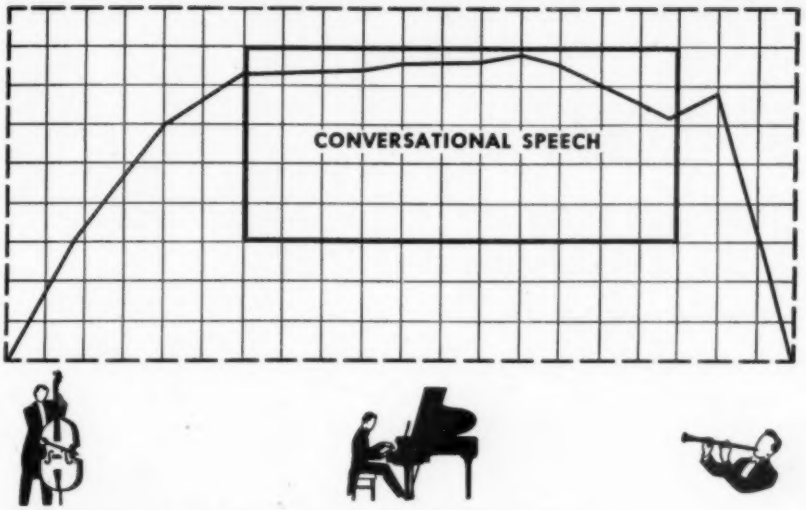

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• To enable the hard of hearing to understand conversation, most hearing aids concentrate on sound amplification within the frequency range of average speech. But pitched higher and lower than that, are many of the tones and overtones that lend shading and color to sound.

The chart above shows how one make of hearing aid has attained a frequency response that means an appreciable gain in potential acuity for the hard of hearing. Note that the broad, plateau-like curve includes most of the area within which useful and enjoyable sounds fall. The level of this frequency response can be adjusted to the individual hearing loss of most users.

You will find that a hearing aid with a frequency response of this character gives better recognition of voices and keener enjoyment of radio, movies, and theater.

The Western Electric Hearing Aid is one hearing aid that has a frequency response like that shown in the chart.

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•New Machines and Gadgets•

⚙ *PORTABLE service station supplies high-pressure lubrication for farm trucks and tractors in the field. The small unit, mounted on two wheels, has gasoline power, and its own air compressor which will inflate tires as well as put grease and oil where needed.*

Science News Letter, July 7, 1945

⚙ *ELECTRIC MOTOR, explosion-proof, for use in rooms where the surrounding atmosphere is charged with ethyl ether vapor, is so enclosed in a metal casing that ignition of the vapor is prevented. It is built to meet the specifications of the Underwriters Laboratories, Inc., and carries its label.*

Science News Letter, July 7, 1945

⚙ *STRAIN-GAUGE, to measure stress-strains in metal construction in bridges, automobiles, aircraft and other structures, consists of short fine wire cemented to the material under test. Instruments, electronically operated, measure and record the electrical resistance in the wire, which varies with elongations and contractions.*

Science News Letter, July 7, 1945

⚙ *LIP MICROPHONE is fitted with an especially designed gland that will pass air but exclude water. If the wearer gets ducked in a beachhead landing, the microphone, shown in the picture, is unharmed by the water. Up to 25 minutes under 10 inches of sea water is safely withstood.*

Science News Letter, July 7, 1945

⚙ *FOURTH-OF-JULY pistol, made of plastics instead of metal, has few joints and therefore probably longer life than the usual toy gun. When the trigger is pulled, an inner metal spring strikes the side, making a "bang" somewhat like that of a real pistol.*

Science News Letter, July 7, 1945

⚙ *GAS-PROOF shirt has special flaps that fold upon themselves in the front opening, and others at the cuffs. They prevent the entrance of poisonous gases when closed and buttoned, forming a triple-ply closure when pulled together and fastened over the chest.*

Science News Letter, July 7, 1945

⚙ *REAR-VIEW device for automobiles is made of a series of connecting tubes extending from a position in the fore part of the car through the rear, with a mirror at each angle. A wide-angle lens on the rear gathers the view and projects it on a ground-glass screen in front of the driver.*

Science News Letter, July 7, 1945

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 266.*

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